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METHOD FOR MANUFACTURING MODULAR, HIGHLY LINEAR MOS CAPACITORS USING NITROGEN IMPLANTATION

ABSTRACT OF THE DISCLOSURE

A metal oxide semiconductor (MOS) capacitor formed according to a process in which Fermi level enhanced oxidation is suppressed by the introduction of nitrogen impurities into an N-doped impurity region is formed to utilize the N-doped impurity region as a lower electrode and includes a capacitor dielectric having a reduced thickness with respect to other portions of the thermal oxide film formed over N-doped impurity regions. The capacitor is highly linear and includes a high capacitance density. The process used to form the capacitor includes thermally oxidizing a substrate such that an oxide film is formed to include multiple thicknesses including an enhanced oxide growth rate producing an oxide film of increased thickness in N-doped impurity regions and a section within nitrogen-doped impurity portions of the N-doped impurity region in which the enhanced oxidation growth is suppressed and the film formed in this region includes a desirably reduced thickness.

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